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An
Essay on Generation
by
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of
Charleston S.C.

Pafsd March 25th. 1824
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"The explaining correcting and confirming the observations of our predecessors is more useful and as honourable as hunting after new discoveries of which the truly learned will find but very few whatever the ignorant may imagine" (Grant) — —

The subject of the following essay is one which has engaged the attention of Physiologists of different ages and acknowledged talents - I do not take it up with the hope of improving it, or adding any thing to the stock of information already collected. Although it presents a fine field for speculation, it is very doubtful whether it is susceptible of such improvement as would promise to be of great practical utility, "but" as Dr Denman remarks "it is impossible to say, to what the discovery of any truth may lead before it is discovered. But it is happy for us that those things which are beyond the comprehension, or which elude the observation of men of plain understandings are of the least importance in practice Providence having ordained, that the honest and industrious application of common capacities should render us equal to the exigencies of life, and the duties we owe to Society" —

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Life says an old French writer is not the property of the individual but of the species - Notwithstanding all the care taken to keep up the active energies of the functions of support, the proper and exact proportion between waste and supply in the animal economy, the former predominates after a certain length of time, old age comes on, the system gradually decays, and death, necessarily ensues, from the progressive failure of the faculties and vital powers. ——— But though individuals thus perish, it is not the intention of nature that the race should become extinct, and the function of Generation was ordained for its preservation - The Philosophical Physician should not direct his attention exclusively to the safety and comfort of the individual - The evils invariably attendant on the advancement of civilization and refinement unless obviated, strike at the fertility of the human species, as well as at the proper and vigorous developement of the frame and constitution, Hence we find sterility to be an increasing affliction among females in more refined

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life, sterility, than which there is no curse more
bitter, no misfortune more intolerable — Savage and
Civilized Nations unite in taunting unfeelingly the
unhappy female, who disappointed in her chief hopes
leaves unfulfilled the principle object of her phy-
-sical existance, and passing away like a vapour
"dies and leaves the world no copy" — Bonaparte
being asked (by Madam de Stael) who was the gre-
-atest woman in existance replied she who has borne
the greatest number of children, and the living Jewels
of the Roman Mother are acknowledged by universal
feeling to be more valuable than all the treasures
of the Indies — If then barrenness be so deep a curse
and the desire of offspring an instinct so general,
gratification or disappointment in this particular
the source of so much happiness or misery, we must
be surely culpable in neglecting the diligent study
of the means of removing the evil or promoting the
good — But the first step in the progress of our endea-
-vours to ascertain these means must be an attentive

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examination of and investigation into the functions in its natural and healthy condition — Generation is a process so mysterious and so far removed from our immediate inspection, that its intimate nature, and precise method, in which it is performed will probably remain forever unknown. The unlimited course of experiments however which have been instituted on this subject, and the very attentive observation, directed to all its cognizable steps have collected together a vast number of facts sufficient perhaps for all practical purposes.

The organs destined for its performance differ much in the two sexes, into which the human race is divided yet even in this difference they present a singular and striking analogy — These parts are in the male the testicles, the Vesicula seminalis, prostate gland and penis — In the female, the Uterus, ovaria, fallopian tubes and Vagina — It is not until the lapse of sexual years of early life, that these organs begin to exhibit that peculiar and overbearing influence upon the whole system which they are destined to

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exert for the future — At this period which is termed the age of puberty they are developed with rapidity increasing in size and assuming their determinate forms. The time at which puberty commences differs in different climates. The animal body appearing like vegetable plants to be sensibly effected by the genial influence of the sun, arriving at maturity earlier in warm than colder regions — The extremes may be found in Asia and Africa where the female is said to be fit for child bearing at ten or eleven years of age; and in Laplanc not until they have arrived to their eighteenth or nineteenth year, under our temperate sky we may fix on the fifteenth year as the medium time at which both the sexes undergo these changes, The influence exerted by the developement of the genital organs is by no means confined to particular portions of the body, although it is on particular parts that the most striking and visible effects are produced, The appearance and even structure of the whole system undergoes

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particular modifications — The proportions of the skeleton are at this time materially altered — Camper asserts that if the male & female forms are placed within an elipsis of equal dimensions, the shoulders of the male will be without and the pelvis within — while the female shoulders will be within and the pelvis without — This greater capacity of the pelvis while the rest of the body is on an average one fifth smaller than that of the male arises from the greater expansion of the ossa Ilii — the greater concavity and breadth of the sacrum and the consequently larger angle of the junction of the ossa pubis — In man these changes are evidenced by hoarseness of the voice, which is sometimes attended by a swelling of the neck; by the growth of hair upon the breast, body, chin, face and pubes and by an increase of masculine manners in his deportment — In woman a peculiar softness and timidity of behaviour, paleness and langour an enlargement of the proportions of the pelvis and a plumpness and roundness of the mammæ, are the

forous . . of this period, which is then particularly denoted by a discharge from the vagina of a bloody looking fluid which has received the title of the menstrual flux, not only does it show itself at the time of female puberty . but is destined to recur at each returning lunar month, until old age has taken from the woman her fitness for her part in the process of Generation — The presence of this fluid is said to be an essential token of the aptitude of the uterus for conception, but this does not seem to be the fact, for it has also been said that women have conceived who were never known to menstruate but its aberration from a healthy condition are certainly among the principle causes of sterility as to the periodical returns of this evacuation, it must be attributed to the same law of periodical revolutions that governs all the functions of the human body — The mode in which the developement of the sexual organs at the time of puberty produces the changes above described upon the gen

-eral system is totally unknown. The extent of these changes is unanswerable stamping not only the physical but the moral character of the sexes, they impress upon the intellect of each sex a particular complexion. The passions of the mind are for a time directed to, and full of, but one object and becomes in some cases so unruly as often to trample down and disregard the most sacred, social, and moral ties, The whole constitution is shaken by the violence of these physical and moral tumults and the health of many of both sexes receives permanent an irremediable injury in the concussion. This influence prevails so universally over the whole of the mental disposition and the bodily frame of women in particular, that it has long since been said of her "mulier est quod est propter uterum solum" There is however in this maxim a mistatement as to the source of the sexual influence, the ovaria, not the uterus, are to be looked upon, as the origin, of all the female peculiarities.

Generative

In several instances their extirpation has been followed not only by barrenness as in the lower animals, but by the growth of beard and other approaches in appearance and character to those of the male, this is not the case with the Uterus.

As nature would not leave to his boasted reason the individual preservation of man, but confided his safety to the internal impulses of hunger and thirst, so, she has ordained this strongest of instincts the generical appetite to force us irresistably to attend to the most important object, the security and certain continuance of the race. Driven by this most powerful want, the sexes seek each other and find the gratification of their desires in the act of coition. The object of this is to procure the deposition of the male semen within the Vagina, and as near as possible to the mouth of the Uterus. This fluid is a secretion from the Vessels of the testicles, which, mixed with the fluids from the Vesiculae seminales, the prostate, and the mucus of the Urethra is thrown forth with considerable force by the

ejaculator and other muscles at the moment of the most intense pleasure its emission is attended with something like a convulsion of the whole system, which has been in some cases so violent as to endanger the life of the individual. Sometimes the same indescribable pleasure is experienced by the female, but this is not essential to impregnation for women have been known to conceive who found no kind of enjoyment in sexual connection. A French Lady of rank is reported to have said that she knew nothing of procreation but its sorrows and pains. Dr Dickson made mention in his lectures of an individual (widower) who informed him that although twice married he had never discovered in either of his wives the least manifestation of pleasure or gratification during coition yet he was the father of children by both. These are singular and unaccountable facts, I confess for my part I should have thought it impossible a priori for a copulation to have been successful without a pleasurable sympathy on the part of the female, as impregnation seems to consist in a

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set of associated actions, in which the highest degree of physical pleasure would appear to be a necessary ingredient. There is however an important inference to be drawn from them, It has been a much disputed question whether an action for rape could be legally sustained when the woman had afterwards proved pregnant. It has been laid down as a rule, that mental force is never successful against the consent of the person violated, that therefore the unchaste female must be under the infamous imputation in such cases both of perjury and participation in the heinous crime. Good attempts to get over this defficulty by the disgusting supposition that there may be so high a tone of constitutional orgasm as to be beyond the controul of the individual who is thus forced are not to be respected even by a virtuous recoil and a sense of honour at the time. The instances I have related are I think sufficient to decide the question that a participation of pleasure is by no means necessary to the impregnation of the female. The secretion of the

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semen and its deposition in the Vagina is all that belongs to the male in the function of Generation. To perform this last it is necessary that the penis should take on erection by which it becomes tumid and hard. The cause of this phenomenon is of difficult decision, the part is spongy in texture and the flow of blood to it is increased to such a degree, that the vessels are unable to return it as fast as they receive it. Bichat says that the Corpora Cavernosa dilate spontaneously and an accumulation thus ensues, determination to it, is occasioned by various species of excitement more particularly however by the stimulus of imagination and the most singular circumstance about it is, the rapidity with which it comes on and disappears. The stimulent effect of the seminal fluid is by no means necessary for the occurrence of turgescence of the penis for it is said to take place in Eunuchs and I have myself frequently observed a compleat erection in

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the penis of the Gelding. The offices performed by the female in the function of Generation are not to be so distinctly laid down, nor are they by any means clearly understood, whether any, or what sort of action goes on in the internal organs at the time of a successful copulation, that is at the moment of impregnation we cannot say. The majority of women have at this juncture no peculiar sensation which would lead them to imagine that any thing uncommon had occurred or was about to take place, with some few women the case is different. I know not whether their assertions be true, or, whether they are influenced by strong imagination, but I have been assured by more than one that they could distinguish when the Venereal congress had been fruitful, by certain peculiar feelings which they either could not or would not describe. For many ideas of the state of these internal organs immediately after copulation we are obliged to refer to comparative anatomy

From this source have been drawn a few facts which appear to be indisputably settled — First — that the ovaries are the seat of conception — second — each of the ovaries contain a number of vesicles filled with a transparent fluid — third — a short time after successful coition one or more of these vesicles enlarge, loose their transparency and finally burst and discharges its contents, which is received by the fimbriated extremities of the fallopian tubes and conveyed to the uterus. After the escape of the albuminous drop from the ovarian vesicles, the lips of the opening through which it passed are closed by a cicatrix and the remaining vascular membrane fills up with lymph of a fleshy appearance slightly yellow, and hence receiving the name of Corpus-Luteum. These Corpora Lutea were formerly imagined to exist only in consequence of fruitful coition, and hence to be infallible signs of conception. But this is denied by Blumenbach and Home who testify to the existance of Corpora Lutea in virgins

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Some even asserts that the corpus Luteum is not a formation filling up as was supposed the cavity of the rupture vesicle, but the substance in which or by which the ovum is produced and therefore by no means admissible as a proof of conception. The different theories which have been invented for the purpose of accounting for and explaining the phenomena of Generation are too numerous and for the most part too absurd to require particular notice. I shall therefore merely hint at a few as I pass to those which at present agitate the physiological world. The first opinion recorded according to Dr Denman was that of Pythagoras who supposes that from the brain and nerves of the male a moist vapour descended in the act of coition from which similar parts of the embryo were formed, these were supposed to be the seat of the soul, and the source from which the senses were derived the other parts he immagined were composed of the blood and humours of the Uterus.

He accordingly thought that conception took place in the cavity of the Uterus, by the mixture of the proportions of the male and female semen, each of which equally contained the organic principle of the embryo.

Galen presumed that the formation of the embryo depended upon the male semen and the menses supplied by the female nourished it.

"Harvey tells us that an iron by friction with a magnet becomes possessed of magnetic power, so the Uterus by the act of coition acquires a plastic power of conceiving an embryo, in a manner similar to that by which the brain is capable of apprehending and thinking".

In his endeavour to establish a theory which would withstand the galvanic powers of reason, Leuwenhoeck thought that he had discovered by microscopical observations numerous animalculi swimming about in the semen of the male, which only required a warm nidus, as the Uterus to nourish and bring them to perfection, But this theory was overturned by

the circulation which was arrested, is a miscarriage, as in the case of a hybrid or mule not being capable of propagating its species.

Some ~~[illegible]~~ have suspected that the semen being deposited in the vagina was from thence absorbed into the general circulation and conducted to one of the ovaria where it performs the first impregnating one or more ova. But the examination of animals during the act of coition and many immediately after, fully proves that the semen is received into the cavity of the uterus, besides if this was the fact, by what law, I would ask of the animal economy is the fecundating fluid (so generally diffused through the circulation) determined to one particular ovum, why not all be alike affected and a woman bear fifty or sixty children at the same time, this theory was been rapidly received and ably refuted by one of the greatest ornaments of science of the present day. "It follows, says he, from this theory that generation might be

carried on by the circulation and that by inserting some semen in the skin of the female we might raise a flock of children as easily as we can produce a tumoral tube or a crop of varicous pustules" - many other notions have been proposed with a view of explaining this misterious operation, to enumerate all would be an endless as well as fruitless undertaking, I shall therefore enter into the consideration of but two which seem to divide the principal Physiologists of the present day. These differ principally in this. The first attributes the impregnation of the female and fecundation of the germ, to the actual contact of the male semen with the ovum or fluid of the ovarian vesicle, while the latter which is called the sympathetic doctrine and was first promulgated by Haighton attributes the effect produced by a successful copulation to the all-sufficiency of the power called sympathy. - It is to be observed however that on neither of these principles can the

pretend to explain the immediate or intimate and direct manner in which the phenomena of fecundation are produced, the actual mixture of fluids as believed by the ancients and the influence of sympathy being both equally inadequate. The question turns upon this point exclusively — Does the male semen, entering the Uterus of the female, pass onwards through the Fallopian tubes to the ovaria, so as to reach the ova contained in those bodies? If indeed it does, we are to presume this to be a necessary condition to ovum impregnation, if it does not, we must look for some other mode in which fecundation may take place, and this may be as well sympathy as any imaginable. The arguments against the affirmative of the question therefore may be deemed as deciding in favour of the Sympathetic doctrine. Let us examine these seriatim at length. It is asserted that from the structure and natural condition of the parts, the male semen cannot possibly progress beyond the vagina, because of the

insufficiency of the projectile power of the male organ — because of the spissitude of the seminal fluid — because of the rugus structure of the vagina. It cannot enter the Uterus it is said because of the oblique or backward direction of the mouth of this viscus — because of the smallness of the opening of the os tinea — because this orifice is filled up with a thick glutinous mucus — because of the narrowness of the canal through the neck and body of the Uterus. It cannot arrive at the ovaria because of the peculiarity of structure of the fallopian tubes, and, because these tubes being known to convey the ovum to the Uterus we have no right to imagine them to be invested with a double office and action of carrying semen to the ovaria. To this host of difficulties incident to a healthy and natural state of the sexual parts others are still added resulting from morbid derangement or congenital deformities — 1st The penis has its power of emission lost or abridged by structure

strictures, debility &c. 2dly The Vagina is obstructed or shut up by adhesions of its sides, by membranes of morbid growth, tumors &c. 3dly The Os Tincæ is sometimes originally or from inflammation impervious and is occasionally rendered entirely inaccessible by obliquity, retroversion, or prolapsus of the womb

To the first class of objections arising from the natural state of the parts it is only necessary to reply that the semen has been in numerous instances found within the cavity of the uterus, not only of the human but likewise of animals. Haller (who had the prudence to observe and candour to remark that some of those who believed they had found semen in the uterus found mucus only) once saw it he says in the uterus of a sheep 45 minutes after coition

John Hunter actually saw it projected per saltum into the uterus of a bitch which he killed and laid open during their union with the male. Ruysch asserts that he found it not only in the uterus but in the fallopian tubes also of two women, the one

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a common woman murdered by her Paramour immediately after impregnation, the other a married woman impregnated a few hours previous and killed in the act of adultery by her husband. To contradict all these we have the results of the experiments of Haighton and others who did not find any semen beyond the vagina, but De Graaf could not even find it there Hartman and Sunemey could not perceive any of those changes in the state of the fallopian tubes at any time which were observed by other experimenters. But their negative experiments cannot surely overturn our confidence in the positive affirmation of their opponents. It is then in my humble opinion fairly made out, that it is not impossible for the semen to arrive within the uterus — we have the assertion of Ruysch that he saw it within the fallopian tubes the structure of which small in its commencement and enlarging, somewhat resembles a lacteal or vein, by no means distinctly indicating their insubservieancy to the office of conveying this fluid

Its function too being peculiar does not forbid a peculiarity in its mode of action, even allowing that its two fold propulsion is not analogous to the natural action of any other tube in the body — We come next to examine the causes of impregnation when there was a morbid condition of parts — and here I would beg leave to remark that I think it by no means necessary that the semen should be just injected into the Vaginal canal, it is a sufficiently sufficient if deposited within it — if this be the fact it removes then at once the objections drawn from the first set of cases, those in which the power of menstruation is lost or abridged — In the second, when the Vagina is obstructed by an imperforate hymen or otherwise, it should be observed that when the obstruction is total and compleat there can be no passage for the menstrual fluid which will be collected behind the barrier, whatever it may be, and in this state of things, it must be impossible for impregnation to take place, when the obstruction

is not absolutely total, the objection goes for nothing, for the smallest quantity of semen injected may find its way to the Uterus &c and may be sufficient for impregnation, as may be shewn by referring to the experiments of Spallanzani, who mixed three grains of frogs semen with a considerable portion of water and fecundated nearly all the numerous posterity contained in the threads of the female. Even on the theory of Haighton, the introduction of the semen into the Vagina is absolutely essential to the commencement of the series of sympathetic actions on which impregnation depends. It is not proved (that I am aware of) that there is any instance known and well authenticated in which total occlusion of the Uterus existed previously to impregnation, indeed I am at a loss to imagine how this could be ascertained. — How the semen arrives at the Uterus I confess I am at a loss to determine, it is enough to say that it has taken place in numerous instances, we shall be

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prepared to account for this phenomenon when it is known how absorbents take up chyle, how the nervous influence is communicated in the two fold manner, in which it passes from, and to, the brain, and how in the external world a solid substance is decomposed and makes its way under the galvanic influence through the most impermeable bodies. Let us now examine the sympathetic theory by which all the difficulties above recounted are said to be removed or avoided — The semen says Dr. Haighton introduced into the vulva first stimulates the Vagina, os uteri, uterine cavity, or all of them By sympathy the ovarian vesicles enlarge project and burst — By sympathy the fallopian tubes incline to the ovaria, embrace them, and convey the rudiments of the fœtus to the womb, and by sympathy the uterus prepares for perfecting the formation and growth of the fœtus, Dr. Haighton takes it for granted, that the swelling and bursting of one of the vesicles in the ovarium, is a certain test of impregnation

this phenomenon took place regularly, whether the Fallopian tubes was cut or obstructed, he therefore concludes that the passage of the semen is not necessary to impregnation. But I have already brought forward from Home and others facts to show that this his test is fallacious, and that neither the bursting of a vesicle nor the presence of a corpus luteum can by any means be considered as a sign of impregnation. Now, his experiments would have been more satisfactory and to the purpose, had he ascertained the actual fecundation of any of these germs by allowing it to grow and develope itself in the ovarium, in the tube, or in the abdomen as sometimes happens in extra uterine pregnancies in the human subject. Indeed it appears from the same experiments that the continuity of one of the tubes at least, was necessary to any action in the part of generation and the sympathetic conveyance of it, to and from the ovarium, For even sexual desire is extinguished in the Rabbit

when both tubes are cut, and sometimes when only one. If the other doctrine be at all admissible it must necessarily be preferred, on account of the great obscurity of this of Haightons, which appears to lay down or affirm nothing, except our ignorance of all but certain bare facts, which are assumed as the basis of all speculation on these dark subjects. For my own part I think that the numerous instances, which we know of the extreme pains and care taken by nature to ensure the contact of the male and female secretions in these instances when it takes place out of the body (and can be managed artificially) affords us strong and logical reason, to believe that she had, taken equal care to promote the same contact in these species of animals, when it occurs within the body and is therefore entirely hidden from our eyes. There is a very great diversity of miscellaneous facts collected, which are conformations of the general intention of nature to effect an actual

mixture or union of the male with the female generative fluids, The very great similarity which exists between the child and both its parents is plausibly accounted for upon this principal, Thus also we may trace the descent of all those individual peculiarities, predispositions and diseases which are so universally observed to be of a hereditary character In this manner also and in no other can we account for the appearances of mules and hybrid animals which partake in almost equal degrees of the external qualities and internal conformation of both their parents. In fact this mixture of qualities is so steadily invariable, that it is a subject of known and calculated certainty.

Having cursorally noticed some of the theories of generation, which have at different times engaged the attention of the Physiologist, and more particularly the grand division of the present day I shall now proceed to consider the changes in the uterus during pregnancy and the mode in which the ovum

it then develops and nourishes. — As preliminary to the consideration of this part of the subject, I shall lay down as in my opinion tolerably correct, the following quotation from Dr Denman "Previous to or during the act of coition, it is presumed, that one or more of the Vesicles, or ova, contained in the ovaria, is brought to a state fit for impregnation, and that the male semen, being transmitted into the cavity of the uterus, is there conducted by one of the Fallopian tubes, to one of the ovaria where it perfects the rudiments of the foetus, or impregnates already perfected, with the principle of life — The prolific ovum having undergone its first changes in the ovarium, is then loosened from its connection, grasped by the fimbria, and reconveyed by one of the Fallopian tubes to the cavity of the uterus". The uterus after impregnation becomes, so to speak, a center of fluxion, it tumifies, and a sort of inflammatory action probably ensues on its internal surface which terminates in the effusion of coagulable lymph

This effusion of lymph is supposed to consist of two laminæ the first called decidua vera lining the cavity of the uterus except at the orifice of the tubes and cervix. The second or decidua reflexa is described by a late writer as being reflected down from the orifice of the tubes, at the entrance of the ovum into it and to invest this body, completely covering it at first as with a pigment, whether this be correct I shall not attempt to decide various opinions being entertained of its formation, "all writers ~~upon~~ this this subject agreeing that its formation is contemporary with conception; and that it precedes the time when the impregnated ovum, passes from the ovarium into the uterus, as is found in the case of an extra-uterine fœtus, It may therefore be deemed an indispensably requisite preparation of the uterus, for the reception of the ovum, and the substance by which this is afterwards connected to the uterus, so that if it were to receive a name from its use it would not be improper to call it the connecting membrane

of the ovum" (Denman) - The uterus undergoes as the ovum increases, a peculiar and spontaneous dilitation its cavity enlargeing, its parieties thickening and its vessels increasing prodigiously in size and in the quantity of their contents - this enlargement by no means deserves the name of dilitation, the parieties of the uterus instead of being stretched in any degree, becoming thicker and thicker as the organ increases in size, It has been well observed by Dr Dewees one of the first accoucheurs of the age That the fundus and cervix of the Uterus seem to constitute two distinct parts of the organ which rather antagonize than cooperate with each other, the fundus enlargeing at first, while the cervix undergoes no change, the cervix afterwards dilating while the fundus contracts - For a long while the fundus or body of the uterus is alone enlarged, but the neck at last partakes of the increase, and the pelvis being no longer capable of containing its bulk, it rises into the abdomen

with a motion distinctly felt in most women, and in some producing very unpleasant sensations sometimes before the expulsion of its content, it has attained such a size, as to be productive mechanically of great inconveniences, as difficulty of breathing, from its pressing up the diaphragm cramps and swelling of the legs &c. from pressure on the nerves and vessels of the lower extremities

The Uterus however does not always receive the product of impregnation, certain causes not wele understood occasion at times the retention of the fecundated vesicle in the ovarian constitution, ovarian pregnancy, or the imbriated extremity of the fallopian canal not being attached sufficiently close to the surface of the ovarium, permits it to drop into the abdominal cavity, or being received into the canal its passage is by some means obstructed and it remains in the tube.

In all these cases it is slowly developed as in the uterus, which feels and exerts its usual sympa-

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-thetic operation, which cannot be in general distinguished from common uterine pregnancies until the ordinary time of labour, which of course cannot progress. The ovum as early as the 8th day has been found in the uterus enveloped in its two membranes in all probability the same which are afterwards distinguished by the name of chorion and amnion, the external surface of the outer (or chorion) is nearly covered with beautiful flocculi, by means of which the ovum attaches itself to some part of the uterine cavity and then forms the rudiments of the placenta. - Between the chorion and amnion there is in the very early part of pregnancy, a clear fluid called liquor chorii, of doubtful origin and short duration for it disappears in the advanced stages — The amnion is filled to the last period of gestation with the liquor amnii, a mild, thin aqueous fluid, the use of which, is undoubtedly to defend both the uterus and fœtus from unequal

or irregular pressure, and during the delivery of the child, to effect with more mechanical advantage and less injury the distension of the soft parts of the mother, within this fluid is suspended the embryo which is gradually developed, its parts forming in a succession not actually known. The position of the fœtus in utero is such as to take up the least possible room. Its head is downwards, its knees are drawn up to its belly, with its heels close to its buttocks and its arms folded upon its breast. It is connected with the uterus of the mother by means of the umbilical cord, which is extended from the navel of the fœtus to the placenta, and is of various length, consisting principally of two arteries and one vein. The placenta is a spongy parenchymatous structure uniting together the ramifications of vessels, which branch out with great minuteness. It consists of the fœtal and maternal portions, this latter containing the terminations of veins and arteries sent into it from the uterine vessels, and the fœtal formed in

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like manner by the radicals of the umbilical veins and arteries, It is usually fixed to the fundus of the uterus, though it varies much in location as well as size – The placenta has been generally acknowledged to be the chief instrument of the nourishment of the fœtus, yet the mode in which it contributes to this purpose is by no means well ascertained – The best Anatomists have been unable to discover any anastomosis between the fœtal and maternal vessels within it, Experiments have found the mother uninjured by the most extensive and even fatal loss of blood from the fœtus, and the fœtus being in like manner unaffected by any loss from the mother, It is certain that there is no immediate vascular connection between the vessels, yet a single experiment of Magendie seems to point out some indirect communication – Injecting into the veins of a pregnant bitch a quantity of camphor, he found a strong smell of this substance in one of her fœtuses taken from the womb in about a quarter of an hour, while

another extracted some minutes before had nothing of the odour. The relation between the mother and the fœtus still remains very obscure and requires continued attentive observation for their developement as to the mode by which the fœtus is nourished I must confess that I am unable even to form a conjecture, the whole process to me being in the utmost degree misterious. The fœtus in utero matures very slowly, it is not adapted to sustain a seperation from its mother until the end of the seventh month, it is then in a condition to respire, and is capable of an independant existence. The peculiarities of the fœtus at this time are chiefly as follows

The Liver is exceedingly large in proportion occupying the greater part of the abdomen — The Lungs are compact and of a dark-red colour — The fore and upper part of the chest is occupied by the thymus which is called a gland but of the office of which we know

nothing, The most striking peculiarity however is in the course of the circulation. The blood entering by the umbilical vein, is carried for the most part into the liver, some of it however passes at once to the Vena Cava by the Ductus Venosus, The heart is not a double organ, having only a single circulation to perform, its auricles and Ventricles are united, so as to form but two cavities, the first by an opening through the parieties of the heart, called from its shape the Foramen Ovale. The Pulmonary artery issuing from the right Ventricle sends but a small branch to each lung, the main trunk bending downwards to enter at an acute angle with the aorta below its curve, Thus the auricles are both filled with blood from the Vena Cava and the strength of both Ventricles excited to propel the blood through the body and towards the placenta. This structure has been known to continue unaltered after birth for the most part attended with great sufferings in

these unfortunate cases, on account of the imperfect purification of blood by respiration, and the transmission of venous blood into the aortic system. In general however immediately after birth, the stimulus of the cold atmospheric air, causes the contraction of the Diaphragm and intercostal muscles, respiration begins, the foramen ovale no longer of use, is closed, the ductus arteriosus becomes an impermeable ligament, and a new life is begun and continued. The human female is uniparous, cases of twins are however not very unfrequent, three children are sometimes born together, yet they are perhaps never, or extreemly seldom, sufficiently perfect in formation or well developed to carry on an atmospheric existance, the same remark applys in those very rare cases recorded of the birth of more than three, Whether twins are always the product of the act of a single copulation is not known although it has become the fashion to deny entirely the possibility of superfetation as it is cal-

-led, or the succesive impregnation of different germs. There remains I think no uncertainty on this point, the changes in the uterus, which fol=-low the fecundation of a germ, are not immediate they require for their occurrence, some few days after which superfetation apriedly must be impossible, in the mean time I hold it as establis=-hed by an immense number of facts that anoth=-er ovum may be stimulated into life and descend into the cavity of the uterus, That different con=-ceptions says Blumenbach may occur from the repetition of copulation after very short intervals, is proved by the instances of adulterous women, who have brought forth twins resembling different fathers in the colour of their skin. A case of this kind came under my own observation about two years ago in marion district S C & and we find it almost invariably the case amo=-ng dogs. It has been doubted whether the uterus possesses muscular structure, Be that as it may

to a generally Law ultimately depend

however, at or about the end of nine calender months, the contractile powers of this organ are excited into action for the purpose of expelling the ovum now matured. The immediate cause of its taking on this action, and at this time is not ascertained, nor probably never will, the best way then to account for it is by refering it on to the will of God ----------